TECHNICAL REVIEW DOCUMENT
For
MODIFICATION TO OPERATING PERMIT 95OPAD047

Colorado Interstate Gas Company – Watkins Compressor Station
Adams County
Source ID 0010036

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I. Purpose:

This document establishes the decisions made regarding the requested modifications to the Operating Permit for the Watkins Compressor Station. This document provides information describing the type of modification and the changes made to the permit as requested by the source and the changes made due to the Division's analysis. This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the information provided in the original request for modification submitted to the Division on February 17, 2006 and various e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Permit Modification Request/Modification Type

The renewal operating permit for the Watkins Compressor Station was issued on July 1, 2003. The source submitted a request on February 17, 2006 to appropriately correct the description of emission units E001 and E002 (reciprocating internal combustion engines) and to include fugitive VOC emissions in the insignificant activity list in Appendix A. Engines E001 and E002 are identified in the current Title V permit as 4-cycle rich burn engines. The February 17, 2006 application indicates that the lean burn designation is appropriate because the revisions to Regulation No.7 which were adopted in March 2004 (effective May 31, 2004) to address reciprocating internal combustion engines included a definition of lean burn engines (greater then 2% oxygen in the exhaust gas) and that the engines are always operating in lean burn mode (i.e. well above 2% oxygen in the exhaust). Colorado Regulation No. 7, Section XVI included provisions to exempt existing lean burn engines from control requirements if

their owners and operators could demonstrate that the cost of controls would exceed $ 5,000 per ton and that such demonstration must be submitted by May 1, 2005. The source submitted a request for such an exemption on April 29, 2005 and in an October 12, 2005 letter, the Division agreed that the exemption applied to engines E001 and E002.

Since emissions from these engines have been estimated in the past using AP-42 emission factors for 4-cycle rich burn engines, with this request to appropriately identify these engines as lean burn engines, the source is requesting the use of the appropriate AP-42 emission factors. These engines are permit exempt, so there is no change to permit limits but a change in the potential to emit for these engines due to the change in emission factors. The change in emissions associated with the AP-42 emission factor change is shown in the following table.

	Potential To Emit (tons/yr)			Emission Estimation Method
	NO_X	CO	VOC	
Engine E001 & E002, as Requested by this Mod.	300.2	41	8.7	AP-42, Section 3.2 (dated 7/00), Table 3.2-2, 4-cycle lean burn engines, NO_X at 90-105% load and CO at < 90% load.
Engines E001 & E002, in Current T5 Permit	264.2	438	2.6	Database of Test Data for 4-Cycle Rich Burn Engines Supporting EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 3.2 (7/00)
Change in Emissions	36	-397	6.1	

The source has also requested to revise the VOC emission limits for engines E003 through E011. The construction permits issued for these units indicated that the emission limits was for non-methane hydrocarbons, not VOC emissions. The source has requested to base the VOC emission from these engines on AP-42 emission factors (Section 3.2 (dated 7/00), Table 3.2-1 for 2-cycle lean burn engines). The change in emissions due to this requested modification is shown in the following table.

Engines E003 thru E011	VOC Emission Factor (lb/MMBtu)	Single Engine	All 9 Engines
		Permitted VOC Emissions (tons/yr)	Permitted VOC Emissions (tons/yr)
Requested	0.12	10.4	93.6
Current Permit	0.42	37	333
Change in Emissions		-26.3	-239.4

The facility potential to emit after this modification is as follows:

Emission Unit	Potential to Emit (tons/yr)			
	NO_X	CO	VOC	HAPS
Engine E001	150.1	20.5	4.3	See Table on Page 10
Engine E002	150.1	20.5	4.3	

Emission Unit	Potential to Emit (tons/yr)			
	NO_X	CO	VOC	HAPS
Engine E003	84.7	26.7	10.4	See Table on Page 10
Engine E004	84.7	26.7	10.4	
Engine E005	84.7	26.7	10.4	
Engine E006	84.7	26.7	10.4	
Engine E007	84.7	26.7	10.4	
Engine E008	84.7	26.7	10.4	
Engine E009	84.7	26.7	10.4	
Engine 010	84.7	26.7	10.4	
Engine E011	84.7	26.7	10.4	
Total	1,062.5	281.3	102.2	56.39

In the above table, the criteria pollutant PTE for the engines is based on either permitted emissions or the appropriate emission factors, design rate and 8760 hours per year of operation. Emissions from the fugitive VOC emissions, the gasoline storage tanks and the cold cleaner solvent degreaser are below APEN de minimis levels and are therefore not included in the above table.

In the above table, the breakdown of HAP emissions by emission unit and individual HAP is provided on page 10 of this document. The HAP PTE is based on the Division's analysis. As indicated in the table footnotes on page 10, the HAP PTE was based on the highest emission factor in HAPCalc 3.0 (GRI field data, GRI literature and EPA) for each pollutant, design rate and 8,760 hrs/yr of operation. Emissions from fugitive VOCs from equipment leaks, the gasoline storage tank and the cold cleaner solvent vat were not included since emissions are below the APEN de minimis levels and the facility is major for HAPs without including them.

Colorado Regulation No. 3, Part C, Section X.A identifies those modifications that can be processed under the minor permit modification procedures. Specifically, minor permit modifications "are not otherwise required by the Division to be processed as a significant modification" (Colorado Regulation No. 3, Part C, Section X.A.6). The Division requires that "any change that causes a significant increase in emissions" be processed as a significant modification (Colorado Regulation No. 3, Part C, Section I.B.36.h.(i)). The change increase in emissions due to identifying engines E001 and E002 as lean burn engines is less than 40 tons/yr for NO_X and VOC. In addition, these engines are exempt from permitting and the requested change is to reflect the appropriate emission factors for the engines, the engines have not been modified. The Division does not require a permit change simply to change emission factors, for a permit exempt emission unit. The change to permitted VOC emissions for engines E003 – E0011 represent a decrease in VOC emissions; therefore this modification can be processed as a minor modification, since there is no significant increase in emissions associated with it.

In the initial application submitted on February 17, 2006, the source did not specifically request that the modification be processed as a minor modification. In an April 25, 2006 e-mail the Division indicated to the source that we considered that this modification

could be processed as a minor modification, if they would choose to do so. The source responded in a letter received on May 16, 2006 that they wished to have the modification processed as a minor modification.

III. Modeling

The requested modification will result in an increase in NO_X and VOC emissions and a decrease in CO emissions from engines E001 and E002. With the requested reductions in VOC emissions from permitted engines E003 through E011, there will be an overall decrease in VOC emissions from the facility. The increase in NO_X emissions (36 tons/yr) from engines E001 and E002 are below the modeling threshold (40 tpy) in the Division's modeling guidance. In addition, as discussed previously, since the change to engines E001 and E002 are just a change in emission factors and the engines are exempt from permitting no modeling is required.

IV. Discussion of Modifications Made

Source Requested Modifications

The Division addressed the source's requested modifications as follows:

Engines E001 and E002 (Section II.1)

In their February 17, 2006 application, the source requested that the permit be revised to reflect that engines E001 and E002 are 4-cycle lean burn engines. The source has requested that AP-42 emission factors be used to estimate emissions. The new emission factors and the new potential to emit (at 8760 hrs/yr of operation) from these engines are shown on the following table:

	NO_X	CO	VOC	Emission Factor Source
New Emission Factors, in lb/MMBtu	4.08	0.557	0.118	AP-42, Section 3.2 (dated 7/00), Table 3.2-2, 4-cycle lean burn engines, NO_X at 90-105% load and CO at < 90% load.
Emissions (tons/yr) Predicted by New Emission Factors[1]	300.2	41	8.7	
Emission Factors in Current T5 Permit, g/hp-hr (E004)	11.4	18.9	0.11	Database of Test Data for 4-Cycle Rich Burn Engines Supporting EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 3.2 (7/00)
Emissions (tons/yr) Predicted by Current Emission Factors[1]	264.2	438	2.6	

[1]Predicted emissions are for engines E001 and E002 **combined.**

According to the original Title V permit application submitted on March 1, 1995, Engines E001 and E002 began operation in 1974. For sources that did not undergo a physical change or change in the method of operation but increase emissions solely due to a

change in emission factors, the Division considers that the emissions from the emission units at the time the unit was installed are at the levels predicted by the new emission factors. With the emission factor changes, the facility would have been a major source for PSD review upon installation and operation of engines E001 and E002; however, PSD rules did not apply to these engines. The original Title V permit application did not list which month in 1974 that these units commenced operation. The preamble to the December 5, 1974 PSD rules indicates that those rules took effect on January 6, 1975 and would be applicable to sources commencing construction on or after June 1, 1975. In addition the December 5, 1974 PSD rules only applied to listed sources and for PM and SO_2 emissions.

The emission factors in the current permit are in g/hp-hr and the permit requires that emissions from engines E001 and E002 be estimated using hours of operation and the maximum horsepower. The Division assumes that the source would still prefer to use emission factors in units of g/hp-hr. The AP-42 emission factors were converted to g/hp-hr, using the design heat rate of the engine (7000 Btu/hp-hr, according to the original Title V permit application submitted on March 1, 1995 and the revised form 2000-302 submitted with the modification application on February 17, 2006), in the following equation:

$$\text{EF (g/hp-hr} = \frac{\text{EF (lb/MMBtu)} \times 453.6 \text{ g/lb} \times \text{design heat rate (Btu/hp-hr)}}{10^6 \text{ Btu/MMBtu}}$$

The following emission factors will be included in the permit for engine E004: NO_X – 13 g/hp-hr, CO – 1.8 g/hp-hr and VOC – 0.37 g/hp-hr.

Engines E003 – E011 (Section II.2)

Although not specifically requested in the February 17, 2006 application, the APENS submitted for engines E003 through E011 indicated lower requested VOC emissions than the VOC limitations in their current permit. The construction permits issued for these engines, indicated that the limit in the permit was for non-methane hydrocarbons (NMHC), not VOCs. In a April 26, 2006 e-mail, the source indicated that they did want to revise their permitted VOC emission limits to reflect VOC emissions, based on the AP-42 emission factor for 2-cycle lean burn engines (Section 3.2 (dated 7/00), Table 3.2-1. The VOC emission limits will be revised to 10.4 tons/yr per engine and the emission factor that will be included in the permit is 0.12 lb/MMBtu.

Fugitive VOC Emissions from Equipment Leaks (Section II.3)

The source submitted information in their February 17, 2006 application indicating with the latest component count and emission factors that emissions from fugitive VOC emissions are below the APEN deminimis level and that this source of emissions should be removed from Section II of the permit and included in the insignificant activity list in Appendix A. The Division agrees that fugitive VOC emissions from equipment leaks are below the APEN de minimis level. The Division asked the source if they wished to cancel the underlying construction permit for fugitive VOC emissions in a May 19, 2006 e-mail. The source indicated that was the case, therefore fugitive VOC emissions have

been removed from Section II of the permit and are included in the insignificant activity list in Appendix A.

Other Modifications

In addition to the requested modifications made by the source, the Division used this opportunity to include changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this modification.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments on other permits, to the Watkins Operating Permit with the source's requested modifications.

General

- The Reg 3 citations were revised throughout the permit, as necessary, based on the recent revisions made to Reg 3.

Section I – General Activities and Summary

- Revised Condition 1.1 to indicate the appropriate attainment status of the area and to reflect that the source is located in the 8-hr ozone control area.

- Removed permit 95AD144 (fugitive VOCs) from the list of construction permits in Condition 1.3.

- Revised the language in Condition 1.4 to add Section IV, Condition 3.g as a state-only requirement.

- Removed Condition 6 (case-by-case (112(j) MACT requirements). The case-by-case 112(j) MACT requirements applied to major HAP sources that had equipment that fell under various MACT source categories for which EPA failed to promulgate standards by a given deadline. Since EPA promulgated standards for all MACT source categories, the 112(j) requirements no longer apply.

  Note that this facility is a major source for HAPS and the status of the following MACT standards potentially subject to the equipment for this facility is as follows:

  Natural Gas Transmission and Storage (NGTS) MACT (40 CFR Part 63 Subpart HHH)

  In accordance with the provisions in 40 CFR Part 63 Subpart HHH § 63.1270(4)(d), an affected source is each glycol dehydration unit. Although the facility is a major source for HAPS, there are no glycol dehydrators at this facility; therefore, the requirements in 40 CFR Part 63 Subpart HHH do not apply.

Reciprocating Internal Combustion Engine (RICE) MACT (40 CFR Part 63 Subpart ZZZZ)

The final rule for RICE was published in the Federal Register on June 15, 2004. The engines in the current Title V permit are 2-cycle lean burn engines and the source has indicated that engines E001 and E002, although currently identified as rich-burn engines, are 4-cycle lean burn engines. In accordance with the provisions in 40 CFR Part 63 Subpart ZZZZ § 63.6590(b)(3), existing (commenced construction or reconstruction prior to December 19, 2002) 2-stroke and 4-stroke lean burn engines do not have to meet the requirements in 40 CFR Part 63 Subparts A and ZZZZ, including the initial notification requirements. Therefore, the RICE MACT requirements do not apply to the equipment at this facility.

Industrial, Commercial and Institutional Boilers and Process Heaters MACT (40 CFR Part 63 Subpart DDDDD)

The final rule for industrial, commercial and institutional boilers and process heaters was published in the Federal Register on September 13, 2004. The insignificant activity list in the current Title V permit identifies a couple of small boilers and process heaters that are potentially subject to the MACT requirements. The provisions in 40 CFR Part 63 Subpart DDDDD (§ 63.7506(c)(3)) exempt existing (constructed before January 13, 2003) small gaseous fired units ($\leq$ 10 mmBtu/hr) from the requirements in 40 CFR Part 63 Subparts A and DDDDD, including the initial notification requirements. Therefore, the industrial, commercial and institutional boilers and process heaters MACT requirements do not apply to the equipment at this facility.

Organic Liquid Distribution (Non-Gasoline) MACT (40 CFR Part 63 Subpart EEEE)

Under 40 CFR Part 63 Subpart EEE §§ 63.2334(c)(1) and (2), organic liquid distribution operations do not include activities and equipment at NGTS facilities; therefore, the organic liquid distribution MACT requirements do not apply.

- Removed fugitive VOCs from equipment leaks from the table in Condition 7.1 and revised the description for engines E001 and E002 to indicate that they are lean burn engines.

Sections II.1 – Engines E001 and E002

- These engines were previously identified as rich burn engines and by identifying these engines as lean burn engines, the source avoids the early action ozone compact requirements for engines in Regulation No. 7, Section XVI and the RICE MACT requirements. Therefore, the Division is including a requirement to continuously monitor the percent oxygen in each engine exhaust to submit an application to modify their Title V permit to add the control requirements in Colorado Regulation No. 7, Section XVI if at any time the oxygen concentration in the engine exhaust is less than 2%.

In a June 23, 2006 e-mail, the source requested that the permit be revised to allow them until January 1, 2007 to install the oxygen monitoring device. The Division has written the permit to allow the source 60 days from permit issuance to install the oxygen monitoring device.

- Based on EPA's response to a petition on another Title V operating permit, minor language changes were made to various permit conditions (both in the table and the text) to clarify that only natural gas is used as fuel in these engines.

Sections II.2 – Engines E003 thru E011

- Based on EPA's response to a petition on another Title V operating permit, minor language changes were made to various permit conditions (both in the table and the text) to clarify that only natural gas is used as fuel in these engines.

- Revised the portable monitoring language to most recent version.

Early Action Ozone Requirements

The Division entered into an early action compact to delay being re-designated as a non-attainment area for the 8-hour ozone standard. The early action compact requires controls to reduce VOC emissions and the control requirements have been included in Colorado Regulation No. 7. This facility is located within the 8-hour ozone control area and as such is potentially subject to the early action compact VOC control requirements. The revisions to Colorado Regulation No. 7 became effective on May 31, 2004. Based on comments made by EPA, Reg 7 was revised on December 6, 2004 and those revisions take effect on March 2, 2005 and were approved by EPA on August 19, 2005 (effective September 19, 2005). The below discussion addressed the applicability of the early action compact control requirements to the Watkins facility.

- Requirements for condensate collection, storing and handling (Colorado Regulation No. 7, Section XII.A), as follows:

  These requirements apply to exploration and production operations, compressor stations or drip stations located upstream of a natural gas-processing plant. The Watkins facility transmits pipeline quality natural gas (i.e. gas that has been processed) to end users, therefore, the facility is located downstream of a natural gas processing plant and these provisions do not apply to the condensate tanks at this facility.

- Requirements for gas-processing plants (Colorado Regulation No. 7, Section XII.B).

  The Watkins facility is not a natural gas processing plant. There is no equipment at the facility that is used to extract natural gas liquids. Therefore, these provisions do not apply to the Watkins facility.

- Glycol Dehydrator Requirements – VOC emissions shall reduce uncontrolled actual emissions by 90% (Colorado Regulation No. 7, Section XII.B).

There are no glycol dehydrators at the Watkins facility; therefore, these requirements do not apply.

- Definitions and General Provisions (Colorado Regulation No. 7, Section XII.D)

  Since none of the provisions in Colorado Regulation No. 7, Section XII apply, the definitions and general provisions do not apply to the Watkins facility.

- Internal combustion engine requirements for new and existing engines (Colorado Regulation No. 7, Section XVI.).

  These requirements apply to rich burn and lean burn engines with a manufacturer's design rate greater than 500 hp. All of the engines at the Watkins facility are greater than 500 hp. There is an exemption from the control requirements for existing (in operation prior to June 1, 2004) lean burn engines if the source can demonstrate that the retrofit technology cannot be installed at a cost of less than $ 5,000 per ton and that such demonstration be submitted prior to May 1, 2005 (Colorado Regulation No. 7, Section XVI.C.4). As discussed previously, the source submitted their demonstration on April 29, 2005 and in an October 12, 2005 letter, the Division agreed that the exemption applied to the engines at the Watkins facility. In their April 29, 2005 letter, the source also indicated that engines E001 and E002 actually operate as lean burn engines (oxygen concentration is exhaust is greater than 2%), although they are identified in the current Title V permit as rich burn engines. The Division agreed that engines E001 and E002 were lean burn engines and that the exemption applied to engines E001 and E002 also. Therefore, the requirements for engines do not apply to the engines at the Watkins facility.

Section III – Permit Shield

- The citation in the permit shield was corrected. The references to Part C, Section V.C.1.b and C.R.S. 25-7-111(2)(I) were removed, since they did not address the permit shield.

Appendices

- Added fugitive VOC emissions from equipment leaks to the insignificant activity list in Appendix A.

- Appendix B and C were replaced with latest version. Removed fugitive VOC emissions from the tables and revised the tables to indicate that engines E001 and E002 are lean burn engines.

HAPS from GRI-HAPCalc 3.0 (Highest Possible)

Unit	HAP Emissions (tons/yr)										
	acetaldehyde	acrolein	Benezene	toluene	ethyl benzene	xylene	formaldehyde	2,2,4 trimethylpentane	n-hexane	methanol	**total**
E001	1.96E-01	8.57E-02	4.98E-02	3.11E-01	3.70E-03	1.47E-02	1.47	1.52E-02	3.73E-02	5.15E-02	2.24
E002	1.96E-01	8.57E-02	4.98E-02	3.11E-01	3.70E-03	1.47E-02	1.47	1.52E-02	3.73E-02	5.15E-02	2.24
E003	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E004	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E005	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E006	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E007	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E008	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E009	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E010	3.66E-01	4.37E-01	7.92E-02	2.34E-02	4.30E-03	1.07E-02	4.57	1.77E-02	7.09E-02	1.88E-01	5.77
E011	3.66E-01	4.37E-01	7.92E-02	2.34E-02	0.00	1.07E-02	4.57	0.02	7.09E-02	1.88E-01	5.77
Total	3.69	4.11	0.81	0.83	0.05	0.13	44.07	0.19	0.71	1.80	56.39

Engine emissions are based on the highest emission factor from HAPCalc 3.0 - (GRI field data, GRI literature data and/or EPA) for each pollutant.